

XVIII.—*The Ethiopian and Oriental Representatives of the Mantodean Subfamily Vatiidae.*—By J. WOOD-MASON, Superintendent of the Indian Museum, and Professor of Comparative Anatomy in the Medical College of Bengal, Calcutta.

[Read November 6th, 1889.]

Genus 1. DANURIA, Stål.

*Danuria*, Stål, Öfv. Kongl. Vet.-Akad. Förh. 1857, p. 169; 1872, p. 387, ♂; Bih. Kongl. Vet.-Akad. Handl. 1877, pp. 69-70, ♂ ♀.—Saussure, Mém. Orthopt. 1870, t. i, p. 309.

DISTRIBUTION.—South and East-African sub-regions of the Ethiopian Region.

1. DANURIA THUNBERGI, Stål.

*Danuria thunbergi*, Stål, Öfv. Kongl. Vet.-Akad. Förh. 1857, p. 169; 1872, p. 383, ♂.—Saussure, Mém. Orthopt. 1870, t. i, p. 444, pl. v, figs. 66, 66a, 67, ♂ ♀.—de Bormans, Ann. Soc. Ent. Belg. 1881, vol. xxv, p. 23.

HAB.—Natal (Stål); South Africa (Saussure, de Bormans).

2. DANURIA BOLAUANA, Saussure.

*Danuria bolauana*, Saussure, Bull. Entom. Suisse 1869, t. iii, p. 79, ♂; Mém. Orthopt. 1870, t. i, p. 310, ♂.—de Bormans, Ann. Soc. Ent. Belg. 1881, vol. xxv, p. 22.

HAB.—Zanzibar (Saussure); South Africa (de Bormans).

3. DANURIA SUPERCILIARIS, (Gerstaecker).

*Mantis* (*Danuria*?) *superciliaris*, Gerstaecker, Arch. f. Naturgesch. 1869, xxxv Jahrg., i Band, S. 210, et v. d. Döcken's Reisen in Ost-Afrika, iii Band, ii Abt., S. 15, Taf. 1, fig. 7, 7a, 7b., ♀ nymph.

HAB.—Wanga, East-Africa.

Possibly an immature female of the preceding.

4. DANURIA ELONGATA, de Borre.

*Danuria elongata*, de Borre, Liste d. Mant. Mus. Roy. Hist. Nat. Belg. 1883, p. 19, ♂.

HAB.—Southern Guinea.

5. DANURIA BUCHHOLZI, Gerstaecker.

*Danuria buchholzi*, Gerstaecker, Beitrag z. Kennt. Orthopt.-Fauna Guinea's 1883, p. 55, ♂.

HAB.—Akkra, Gold Coast.

## Genus 2. POPA, Stål.

*Popa*, Stål, Öfv. Kongl. Vet.-Akad. Förh. 1857, p. 169; 1871, p. 386; Bih. Kongl. Sv. Vet.-Akad. Handl. 1877, p. 70.

DISTRIBUTION.—South-African and Malagasy sub-regions of the Ethiopian Region.

## 6. POPA UNDATA, (Fabr.).

*Mantis undata*, Fabr., Ent. Syst. 1793, t. ii, p. 19, no. 28, ♀.—Charpentier, Orthopt. Desc. et Depict. 1841, tab. 38, ♂ ♀.

*Theoclytus ? undata*, Serville, Hist. Nat. d. Orthopt. 1839, p. 152, ♀.

*Popa spurca*, Stål, Öfv. Kongl. Vet.-Akad. Förh. 1857, p. 189; et 1872, p. 387, ♂.

*Popa undata*, Bates, P. Z. S. 1863, p. 473.—Saussure, Mém. Orthopt. 1872, t. ii, p. 79, ♀ (redesc.).

Two males differ from seven females from British Caffraria, and agree with a very large (63 mm. long) male from Delagoa Bay, in the Indian Museum, in the absence of lobes in the posterior legs, the sole character upon which *P. spurca* is founded by Stål, who was acquainted only with the male sex, of which lobeless hindlegs would appear to be a very usual, if not an invariable, peculiarity.

Bates had already united these two supposed species.

HAB.—Cape of Good Hope (*Charpentier, Serville*); Natal (*Stål, Bates*); South Africa (*Saussure*); Bedford, British Caffraria; Delagoa Bay; Madagascar (*Bates*).

## Genus 3. HETEROCHÆTA, Westwood.

♂ ♀. Body greatly elongated, bacilliform, without foliaceous lobes and spines.

Head between the points of the sharp conical corneal spines nearly twice as wide as the pronotum at its dilatation; vertex concave, its median and sub-median lobes lower than its extensive lateral lobes, which with the eyes are bent forwards at obtuse angles to the rest of the vertex.

Organs of flight coloured: tegmina with the marginal field irregularly reticulate, the anterior radial forked just before the apical fourth, the posterior radial simple, the anterior prong of anterior ulnar simple, the posterior 4-branched, the dividens anastomosed with the posterior ulnar just before the posterior margin, and the plicate vein reaching the margin, but sending its three or four branches through the anal gusset, which is hence venose: wings with the anterior area narrow and the anterior ulnar simple and unbranched.

Forelegs: coxæ obclavate, with the inner crest armed at base with lobate saw-like teeth; femora narrow, sinuous above, weakly arched below, where they are armed on the outer edge with 5 very long and sharp spines, on the inner edge with 13 alternately shorter and longer, and on the disk with 4. Posterior legs without foliaceous lobes, but furnished with genicular spines; tibiæ slightly thickened fusiformly, five-crested; 1st tarsal joint hardly longer than the two next together.

DISTRIBUTION.—East-African sub-region of the Ethiopian Region.

#### 7. *HETEROCHETA TENUIPES*, Westwood.

*Toxodera tenuipes*, Westwood, Ann. Nat. Hist. 1812, vol. viii, p. 272.

*Toxodera (Heterocheta) tenuipes*, Westw. Arc. Entom. 1812, vol. i, p. 163, pl. 41, ♀.—

*Heterocheta tenuipes*, Gerstaecker, Beit. z. Kennt. Orthopt.-Fauna Guinea's 1883, p. 56, ♀ et ♂ nymph.

HAB.—West and East-Africa: Senegal (*Westwood*); Bagamojo, Zanzibar mainland (*Gerstaecker*).

#### Genus 4. *HETEROCHETULA*, nov.

♂ ♀. Sexes alike. Body small, delicate, long, slender, bacilliform. Head transverse, depressed, nearly horizontal, pentagonal; vertex much produced above the level of the eyes, distinctly divided by notches and grooves into five lobes, a median, two sub-median, and two lateral, the median with the inner parts of the sub-median forming the upper, the outer parts of the sub-median and the lateral with the eyes to the corneal spines on each side, the two superolateral, and the corneal spines to the labrum on each side, the two infero-lateral sides of the pentagon; middle of vertex concave or convex or level according as the median lobe or the sub-median lobes are the higher or all are of equal height; eyes compressed, laterally very salient, with a short simple or a bifid non-faceted corneal spine at the upper and outer angle; facial shield a transverse band deeply indented by the antennæ and not very distinctly defined basally, and concave apically; a small tubercle between the antennal scrobe and the eye on each side homologous with the curved ridge in *Toxodera*.

Pronotum transversely convex, transversed from the base to beyond the middle of the anterior lobe by a fine raised median line, which at the apex of the posterior and throughout in the anterior lobe is lodged in a shallow groove; its deflexed sides very finely toothed and its disk very minutely and sparsely granuloso.

Terminal tergum of the abdomen transverse, truncated at the extremity. Cerci short, broadly foliaceous.

Organs of flight coloured. Togmina: the veinlets of the marginal field long and very oblique and rarely branched and anastomosed so as to form a reticulum with very long and narrow meshes, posterior radial simple, anterior prong of anterior ulnar ♂ 2-branched, ♀ 1-branched, posterior prong ♂ 2-branched, ♀ 3-branched, dividens not quite reaching the margin, plicate vein reaching the margin, but sending its two branches through the anal gusset, which is hence venose, all the veins straight and much more oblique than in the preceding genus. Wings with the anterior area narrow and the anterior ulnar simple.

Forelegs of the same proportions as in the preceding; the coxæ above depressed and unarmed; femora armed below on the outer edge with 4 spines (order of length 2, 1, 3, 4), on the inner edge with 13 or 14 alternately shorter and longer (up to the 10th, which is followed by 2 or 3 short ones, the series being completed in each case by one which is somewhat longer than any of the rest), and on the disk with 4; tibiæ blunt roof-shaped. Posterior legs without foliaceous lobes, but provided with genicular spines; lateral genicular lobes of feebly 4-cristate femora short or acuminate produced; tibiæ filiform, terete above, feebly bi-cristate below; 1st joint of tarsus not longer than the next two taken together.

DISTRIBUTION.—Indian sub-region of the Oriental Region.

#### 8. HETEROCHÆTULA TRICOLOR, W.-M.

*Heterochæta tricolor*, Wood-Mason, Ann. & Mag. Nat. Hist. 1876, vol. xviii, ser. 4, p. 441, ♀.

HAB.—♀, Calcutta, Bengal (*type*); ♂ ♀, Khurda, Orissa (*var.*).

#### 9. HETEROCHÆTULA FISSISPINIS, n. sp.

Ripe Nymph. Corneal spines bifid. Submedian lobes of vertex conically or triangularly prolonged above the median so as to form an occipital concavity for the reception of the rounded anterior end of the pronotum. Anterior femora triangularly produced in the mid dorsal line over the knee joint, with the last long spino of their lower and inner margin preceded by three shorter ones. Lateral genicular lobes of the four posterior femora acuminate produced, especially in the anterior pair, in which they are twice the length of those of the posterior pair. Tip of abdomen broken off.

Length of pronotum 14 millims., of which the anterior and posterior lobes are respectively 3.75 and 10.25; of anterior coxa 6.66, femur 8.

HAB.—Bangalore, Mysore.

Genus 5. *ÆTHALOCHROA*, W.-M.

*Æthalochroa*, Wood-Mason, Ann. & Mag. Nat. Hist. 1877, vol. xix, ser. 4, p. 308, ♂ ♀.

*Arsacia*, Stål, Bih. Sv. Kongl. Vet.-Akad. Handl. 1877, Bd. iv, No. 10, p. 70, ♀.

♂ ♀. Sexes alike. Body greatly elongated, bacilliform.

Head of moderate size, not wider than the dilatation of the pronotum; occiput concavo; vertex divided by grooves into five lobes, two lateral, which are always conoidally produced or swollen, two sub-median, which may or may not be produced, and one median forming a horizontal transversely convex elevation of considerable antero-posterior extent which widens slightly to its abrupt termination immediately above and behind the stemmata in a vertical flat area with a semicircular or symmetrically sinuous prominent margin, which appears to coincide with the forks of the epicranial suture and may or may not be produced in the middle line into a horn, which may be simple or bifid; furnished at the ocular margins of the forehead with a small spine-like tubercle and lower down at the same margin with a faint wrinkle, on each side; eyes higher than broad, strongly prominulous, tumid, and furnished at the upper and outer angle, or at the junction of the upper and the lateral parts of their contour, with a conical non-faceted spine or at least with a minute round flat smooth tubercle; stemmata large on a three-way tubercle; facial shield pentagonal with its basal angle obtuse and somewhat projecting; clypeus with a strong mesially interrupted sub-apical transverse ridge; labrum convex; antennæ setaceous, much shorter than the prothorax.

Prothorax granulose: pronotum greatly elongated, steeply roof-shaped as to its slightly bowed posterior lobe, with the top of the ridge surmounted in the female by a prominent raised median dorsal line extending into the anterior lobe, which dorsal line is present in the male only for a short distance from the two ends of the pronotum; gradually widening to either end.

2-6 sterna of abdomen with a short sharp carina ending in a point at the middle of their hinder margin, ♂ 7-8 sterna emarginate at the extremity; terga with a raised median line which is produced to a point at the hinder end and increases, the point concomitantly decreasing, in strength to the extremity of the abdomen; 10th tergum flatly roof-shaped, short, about twice as broad as long, rounded at the extremity. Cerci broadly foliaceous, spatulate, rounded or truncate-rounded at the extremity.

Organs of flight when closed hardly extending beyond the apex of the fifth abdominal segment; their marginal fields subcoriaceous, semiopaque, the rest of the tegmina membranous, ♀ semi-transparent,

♂ hyaline, the rest of the wings membranous, ♂ hyaline or at most obsoletely tessellated, ♀ more or less distinctly and extensively tessellated with pellucid brown: longitudinal veins of tegmina very slightly and widely sinuous, almost straight; anterior radial forked at or just before its apical third, posterior radial simple, anastomosed to the anterior for a short distance soon after its origin, becoming again free at the stigma, which is indistinct, colourless, and in the radio-ulnar interspace; anterior prong of anterior ulnar 1 or 2-branched, posterior prong 4 to 5-branched; dividens running to posterior margin or into posterior ulnar; plicata sending its main stem direct to the margin, its branches through the anal gusset, which is hence venose; and the transverse veinlets curved: wings with distinct anal emargination, unbranched anterior ulnar, and first plicate vein forked at or before the end of its basal third.

Anterior coxæ triquetrous, their crests, especially the posterior, granulose-spinulose, the anterior or upper expanded at the apex into a short foliaceous lobe; femora with their upper margin concave, cristate at the apex, their lower armed on the outer edge with 5 spines, of which the first two are sub-equal and longer and the last three sub-equal and shorter, on the inner edge with 12-14 alternately shorter and longer, of which the two last are long ones, and on the disk with 3 small ones; tibiæ weak, curved, slightly enlarged to either end from their thin middle, but especially to the armed end, terete above to within a little of the apex, which is faintly crested, paucispinose, being armed only on the apical fifth of their outer edge and on the apical half of their inner edge, terminal claw long and rather abruptly hooked.

Posterior legs rather short, strongly crested; femora prismatic, without genicular spines, with four crests, which may or may not be expanded into foliaceous lobes and in the latter case are spinulose, their knee-lobes short, submucronate-triangular; tibiæ triquetrous, equal to or a trifle longer than the femora, with three crests, one dorsal and two ventral, with or without foliaceous lobes, in which latter case they are 5-sided and fusiformly enlarged; first tarsal joint short, only about as long as the two following taken together.

DISTRIBUTION.—Indian and [South Indian and]\* Ceylonese subregions of the Oriental Region.

The discovery of two species with well-developed corneal spines has led to the detection of vestiges of those structures in the typical species.

\* The brackets are intended to indicate that no representative of the genus has yet been recorded from the portion of the subregion the name of which is enclosed.

10. *ÆTHALOCYROA ASHMOLIANA*, (Westw.)

*Vates ashmolanus*, Westw., Ann. Nat. Hist. 1842, vol. viii, p. 272; Arcana Entomol. 1843, vol. ii, p. (note †) ♀.

*Æthalochoera ashmolianna*, Wood-Mason, Ann. & Mag. Nat. Hist. 1877, vol. xix, ser. 4, p. 308, ♂ ♀.—P. Z. S. 1878, p. 584.

*Arsacia ashmolianna*, Stål, Bih. Sv. Vet.-Akad. Hand. 1877, Bd. iv, no. 10, p. 75, ♀.

♂ ♀. Margin of anterior end of median lobe of vertex bisinuous with a minute blunt projection on each side of the middle line. Eyes with a minute, slightly convex circular non-faceted spot or tubercle representing a corneal spine.

Tegmina: a finger-print-like mark at the base forming a curved band across the closed organs of flight, a marbling along the marginal field, and some short streaks on the longitudinal veins—deep rich brown, and some obscure brown blotches on the membrane, which in the ♀ is clouded with greyish whity-brown, but in the male is almost perfectly hyaline; the anterior and posterior prongs of the anterior ulnar are respectively 1- and 4-branched; the dividers runs to the posterior margin.

Wings: ♂ the anterior margin and apex marbled with dark brown and the rest hyaline: ♀ the anterior margin and apex more extensively and deeply marbled with dark brown; a tessellated pellucid violet-fuscous blotch of greater or less extent near the base of the posterior area, which is followed by broken and anastomosed concentric waves of the same colour, and also of varying extent and intensity, extending between the seventh plicate vein and the anterior margin to the outer margin, and, when less developed, leaving an ante-apical roundish patch of sub-hyaline in the anterior area.

Four posterior femora with three sub-triangular foliaceous lobes near the apex, one on the upper or posterior of the dorsal crests, and two on the two ventral crests, all arched proximally and sub-dentate distally; tibiae with one foliaceous lobe extending from the knees to the middle of the joint on its dorsal crest and with their two ventral crests foliaceously expanded throughout increasingly from the base, so much so in a female from Ceylon that the joint when viewed from below has a long spatulate outline.

Total length, ♂ 100, ♀ 115 millims.; length of pronotum ♂ 33, ♀ 40, of which the anterior and posterior lobes are respectively, ♂ 7.6, ♀ 9.5 and ♂ 25.4, ♀ 30.5; width of prothorax at supracoxal dilatation, ♂ 4.5, ♀ 5.6, at hinder extremity, ♂ 3.6, ♀ 4.5; length of abdomen, ♂ 46, ♀ 52, width at middle, ♂ 3.5, ♀ 5; length of tegmina, ♂ 45, ♀ 55, width at middle, ♂ 9, ♀ 11, near base ♂, 11 ♀ 12.5; length of wings, ♂ 42, ♀ 52, breadth ♂ 22.5, ♀ 27; length of fore coxa,



♂ 15, ♀ 16·5; femur, ♂ 16·5, ♀ 19·75, breadth at angulation ♂ 2, ♀ 3; tibia, from base to insertion of tarsus, ♂ 12, ♀ 15; of immediate femur, ♂ 12·5, ♀ 15·5; tibia, ♂ 12·5, ♀ 15·5; of posterior femur, ♂ 15, ♀ 19; tibia, ♂ 15, ♀ 19; of antennæ, ♂ 23, ♀ 18; of cerci, ♂ 7·5, ♀ 8·5; width ♂ 2, ♀ 2·6.

HAB.—Bombay (var. *simplicipes*); Calcutta, Berhampur, and Jalpignuri, Bengal; "N. India" (var. *insignis*); Ellore, Godavery District, Madras Presidency (Sir Walter Elliott's drawings); Colombo, Ceylon.

#### 11. *ÆTHALOCROA AFFINIS*, n. sp.

♂. Anterior end of median lobe of vertex produced upwards in the middle line into a small blunt spine or tubercle. Eyes with a sharp regularly conical non-faceted corneal spine.

Organs of flight coloured as in the preceding. In the tegmina the anterior and posterior prongs of the anterior ulnar are 2- and 4-branched respectively and the dividers is anastomosed with the posterior ulnar.

Legs as in the preceding. Fore tibiae with 4-5 spines outside and 7-8 inside.

Total length 78·5 millims.; length of pronotum 26, of which the anterior and posterior lobes are respectively 6 and 20, breadth at supra-coxal dilatation 4, at hinder end 3·25; length of meso- and metanotum with seg. med. 14; of abdomen without seg. med. 38, breadth at middle 4; length of tegmina 36·5, breadth near base 9, at middle 7; length of wings 35, breadth 20; length of fore coxa 11, femur 14, breadth at angulation 3, length of tibia, from base to insertion of tarsus, 10; of intermediate femur 9, tibia 9; of posterior femur 11, tibia 11; of antennæ (broken); of cerci 5·5, breadth 1·75.

HAB.—Sind.

#### 12. *ÆTHALOCROA SPINIFES*, n. sp.

♂. The lateral and sub-median lobes of the vertex are more pointed than in the preceding and the anterior end of the median lobe is produced upwards into a bifid process. The eyes bear a blunt conical, almost finger-shaped, corneal spine. Antennæ greyish whity-brown.

The organs of flight are almost perfectly pellucid and almost colourless throughout, only the marginal field of both pairs being slightly opaque and obsoletely mottled with brownish, and the posterior area of the posterior pair presenting faint vestiges of the basal blotch with succeeding waves of amethystine fuscous which forms so conspicuous a feature in the female of the typical species. In the tegmina the anterior and posterior prongs of the anterior ulnar are respectively 2- and 5-branched and the dividers is anastomosed with the posterior ulnar.



The fore tibiae 4-spined outside and 7-spined inside; the last spine on each side more oblique than the rest. The posterior legs bear no foliaceous lobes: the femora are all armed on each of their two ventral crests with six small spines, so that the spines of the one crest are opposite to those of the other, and the four mean spines subequal and larger than the two extreme in each case; the tibiae are fusiformly thickened, five-sided, bearing five crests, one double dorsal, two lateral, and two spinulose ventral, the intervals between which are transversely nearly level.

Total length 73 millims.; length of pronotum 23, of which the anterior and posterior lobes are respectively 5 and 18, breadth at dilatation 3, at hinder end 3; length of meso- and metanotum with seg. med. 11·5; of abdomen without seg. med. 33·5, breadth at middle 2·5; length of tegmina 31, breadth near base 7·5, at middle 6; length of wings 32, breadth 16·5; length of fore coxa 10, femur 11·5, breadth at angulation 2, length of tibia, from base to insertion of tarsus, 8; of intermediate femur 7, tibia 7·25; of posterior femur 9·75, tibia 10; of antennae 16; of cerci 5·25, breadth 1·65.

HAB.—Karachi, Sind.

#### Genus 6. PARADANURIA, W.-M.

*Paradanuria*, Wood-Mason, Ann. & Mag. Nat. Hist. 1877, vol. xix, ser. 4, p. 220, ♀ nymph.

♀ (nymph). Body elongated, small and delicate, slender bacilli-form. Integument granulose and longitudinally coarsely paucirugose.

Head depressed, thin, horizontal, higher or rather longer than broad, rather broader than the prothorax at its dilatation, with vertex, forehead, and face in the same plane; vertex with its lateral lobes produced above and slightly outwards over the eyes to a blunt tubercle, so as to form an occipital concavity for the reception of the rounded fore end of the pronotum, its median lobe on the disk elevated into a huge convex boss, which is roundly prominent posteriorly or superiorly, appearing in a front view to project above the concave occipital line, and is separated anteriorly or inferiorly by a transverse groove from the subquadrate stemmatal eminence, which bears a blunt conical tubercle at the middle of its posterior margin. Eyes narrow, wall-sided, with the upper part of their contour at right angles to the lateral and a short stout bluntly mammilliform non-faceted corneal spine at the angle.

Pronotum roof-shaped with distinct rounded dilatation, and a raised dorsal line, which is continued to the extremity of the abdomen.

Terminal tergum of abdomen triangular with arched sides. Cerci foliaceous extending by fully  $\frac{2}{3}$  of their length beyond the extremity of

the 7th sternum, equalling in length the four terminal abdominal terga taken together, and widening from the base to the apex, which is divided by a shallow notch into two points.

Anterior legs long and slender; coxæ expanded along the apical fourth of their anterior crest into a conspicuous dentate foliaceous lobe; femora nearly straight above, weakly arched below, with acute genicular lobes and a conspicuous supra-genicular lobe at obtuse angles to the upper margin, armed below on the outer edge with 6 spines, of which the first is equal to the third and the 2nd to the 6th form a slightly decreasing series, on the inner edge with 12 alternately shorter and longer, and on the disk with 3; tibiæ as broad as high, above terete, perfectly straight and uniformly wide throughout from base to insertion of tarsus. Posterior legs very short; the femora stout, slightly tapering at both ends, prismatic, with four strong crests, a blunt ridge on each side between the dorsal and ventral crests, the upper or posterior of the ventral crests foliaceous, long slender genicular and supragenicular lobes, but no genicular spines; tibiæ rather longer than the femora, above terete, below bicristate; 1st joint of tarsus not quite so long as the three succeeding taken together.

DISTRIBUTION.—Indian sub-region of the Oriental Region.

Winged specimens of this genus will be described and figured by Professor Westwood in his forthcoming '*Revisio Mantidarum*.'

### 13. PARADANURIA ORIENTALIS, W.-M.

*Paradanuria orientalis*, Wood-Mason, Ann. & Mag. Nat. Hist. 1877, vol. xix, ser. 4, p. 220, ♀ nymph.

HAB.—Bangalore, Mysore.

### Genus 7. EUTHYPHLEPS, nov.

♀. Body long, rather small and delicate, slender bacilliform. Integument granulose and spinulose especially in the prothorax.

Head somewhat depressed; vertex slightly declivous, its median lobe separated from the submedian lobes by two longitudinal depressions of the disk, the latter triangularly produced backwards, upwards, and outwards so as to form an occipital cavity for the reception of the fore end of the pronotum; forehead and face convexly more declivous, so that, when the head is viewed from the side, the eyes appear to be separated from the submedian lobes of the vertex by a deep notch on one side of which is formed by the eyes, the other by the submedian lobes, and the bottom by the narrow lateral lobes of the vertex. Stemmata large, on a considerable eminence, which bears a

spike-like erect tooth at the middle of its hinder margin, and is separated off from the vertex by a transverse groove. Eyes narrow, oval, convex laterally, produced above the level of the lateral lobes of the vertex, armed at the upper and outer angle with a large stout blunt somewhat curved finger-shaped non-faceted corneal spine.

Pronotum roof-shaped with transversely convex sides, surmounted by a raised dorsal line, which is continued to the extremity of the abdomen.

Abdominal sterna produced in the middle of their hinder margin; terga 1-7 produced in the middle posteriorly to a delicate filamentous process, the last a broadly concave-truncate triangle with the sides arched. Cerci broadly foliaceous, 13-jointed, broadest at the antepenultimate joint, reaching but little beyond the 7th sternum, the upper apex of their last four joints produced so that their upper margin is bluntly dentate and their apex bifid.

Organs of flight extending nearly to the extremity of the abdomen. Tegmina semiopaque, sub-coriaceous, parallel-sided; the marginal field irregularly reticulate; the longitudinal veins of anterior area nearly parallel to the margins with their interspaces narrow and divided by false veins; the posterior area and its gusset produced, with its longitudinal veins very oblique; the anterior prong of anterior ulnar simple and unbranched, posterior prong 6-branched; the dividens anastomoses with the posterior ulnar some distance before the margin, the 4-branched plicata goes to the margin, its 1st and 2nd branches running parallel with it, but dissolving into a common reticulum at varying distances from the margin, and its 3rd and 4th traversing the anal gusset, which is hence venose. Wings hyaline except in the anterior margin and apex; apex blunt not extending far beyond that of the posterior area; anal emargination slight, obtuse-angular; anterior ulnar forked at about the junction of second and apical thirds of its length.

Fore-legs long and slender; coxae expanded for fully the apical third of their anterior crest into a conspicuous dentate foliaceous lobe; femora narrow, slightly sinuous above, that is to say, faintly convex basally and then shallowly concave to the apex, which is produced, as in the preceding genus, forwards and upwards over the femoro-tibial articulation into a supragenicular spine, below weakly arched at base, armed on the straight outer edge with 5 spines, on the inner with 11, and on the disk with 3; tibiae straight, paucispinose, terete above. Posterior legs similar but longer and slenderer than in the preceding genus, and furnished with curved acicular genicular spines longer than the genicular lobes, the lateral ones of which are longer than the dorsal.

DISTRIBUTION.—Himalo-[Chinese] subregion of the Oriental Region.

## 14. EUTHYPHELEPS RECTIVENTIS, n. sp.

♀. Body the colour of a dead twig.

Tegmina semitransparent pale yellowish brown with the marginal field and a long linear streak on the basal half of the anterior prong of the anterior ulnar opaque bright cinnamon-brown. Wings hyaline with the anterior margin semitransparent pale yellowish brown and a decreasing series of four or five streaks on the veins at the apex cinnamon brown.

Fore tibiae armed on the outer edges with 4-4 and on the inner with 6-7 spines, the last of which is strongly directed obliquely towards the apex.

Posterior legs with a slight lobe on the upper or posterior dorsal crest and a well developed one on the upper or posterior ventral crest, which is divided, by a more (posterior pair) or less (intermediate pair) distinct emargination, into two lobes, a smaller trilobulated proximal and a larger crescent-shaped obsoletely dentate distal.

Total length 70 millims.; length of pronotum 19.5, of which the anterior and posterior lobes are respectively 4.25 and 15.25, breadth at supracoxal dilatation 3.25; length of meso- and metanotum with seg. med. 13; of abdomen without seg. med. 33, breadth at middle 2.75; length of tegmina 43, breadth at middle 7; length of wings 39, breadth 17; length of fore coxa 10, femur 16, breadth 1.75, length of tibia, from base to insertion of tarsus, 11; of intermediate femur 10, tibia 10.25; of posterior femur 12, tibia 14; of antennae 19; of cerci 3.5, breadth 2.

HAB.—Kulu, Kangra, N.-W. Himalayas, 3,600 feet (*A. Graham Young*).

## Genus 8. TOXODEROPSIS, nov.

♂ ♀. Body greatly elongated, bacilliform.

Head similar to that of the genera *Toxodera* and *Paratoxodera*, but not nearly so wide, its long axis forming with that of the eyes a much narrower angle; median and submedian lobes of the vertex a little higher than the lateral lobes, slightly arched, separated by a transverse groove from the prominent eminence which bears the large stemmata, and is produced at the middle of its upper or hinder margin into a short erect process, which may be acute or blunt and sub-bifid; eyes oval, convex, produced slightly above the level of the lateral lobes of the vertex, and bearing at their upper and outer angles a long sharp slender incurved conical non-faceted corneal spine; a small tubercle close to the inner and anterior margin of each eye, representing the curved ridge in *Toxodera*; facial shield divided into three parts, one

median prominent semicircular below and between the anteunæ, and two lateral sunken subquadrate, between which and the eyes a very narrow space intervenes.

Prothorax subrugose, and roughly granulose, especially on the edges of the pronotum, much elongated, but shorter than in *Toxodera* and *Paratoxodera*, being not quite equal in length to the basal  $3\frac{1}{2}$  segments of the abdomen exclusive of seg. med., quite straight from end to end; the posterior lobe of its pronotum less steeply roof-shaped with the sides slightly convex transversely and the ridge line, which is distinctly compressed, especially in front, very sharp, and feebly arched longitudinally; the anterior lobe with a raised median line lodged in a shallow furrow, enlarged at the extremity in ♂, as in *Æthalochoera*.

Abdomen smooth and polished, without foliaceous lobes, subparallel-sided, very slightly and gradually widening, and bluntly carinate above, from the base of the 4th to the apex of its 6th segment, thence narrowing more rapidly to its extremity, the last four segments forming a carinated roof-shaped mass with serrated sides; terga 1-6 with a notch accompanied by a very small and delicate filamentous process at the middle of the hinder margin; sterna with the posterior margin arcuately prominent, subcarinate, but without foliaceous duplicatures of the integument, in the middle line at hinder end; 10th tergum triangular a little broader than long. Cerci foliaceous, lanceolate, acutely bifid, as in *Toxodera*.

Organs of flight in shape and structure very similar to those of *Toxodera*, both pairs having the apex anterior, and the tegmina, the interspace between the posterior radial and the anterior prong of the anterior ulnar wide and multicellular. In the tegmina, the marginal field is opaque and only moderately wide, irregularly and strongly reticulate the stigma, which is long and linear, lies as obliquely as possible upon the posterior radial, extending a very short distance into the interspace on each side of the vein; the anterior prong of the anterior ulnar, like the posterior radial, simple, the posterior prong being 3 or 4-branched; the dividens anastomoses with the posterior ulnar, and may or may not give off an anterior branch which does not do so; the plicata runs either direct, or after anastomosis with the posterior ulnar, to the posterior margin, but in either case sends all its branches through the anal gusset, which is hence venose. In the wings there is a distinct anal emargination and a simple and unbranched anterior ulnar.

Anterior legs long and slender; coxæ with the anterior crest for the apical two-fifths of its length expanded into a conspicuous dentate foliaceous lobe; femora narrow, above nearly straight and carinate, the carina ending in a sharp supra-genicular lobe somewhat

longer than the lateral lobes, also almost straight below, where they are armed on the outer edge with 5 or 6 spines, on the inner edge with 11, and on the disk with 3; tibiæ straight, terete above, paucispinoso, the spines in a single short series decreasing from the apex.

Posterior legs short and weak; femora prismatic, slightly tapering to both ends, with four strong crests and a strong blunt crooked ridge on each side giving them the appearance of being bent down near the apex, with three equal acuminate genicular lobes and an acicular genicular spine, which is longer than the lobes in the anterior pair, with the two dorsal crests slightly lobed and the upper or posterior ventral crest expanded into a foliaceous lobe, which is divided into two or more lobules; tibiæ longer than the femora, terete above, (?) obsolete bicristate below; first tarsal joint shorter than the two succeeding joints taken together.

DISTRIBUTION.—Indian sub-region of the Oriental Region.

This genus is closely allied to *Toxodera* and *Paratoxodera*, agreeing with both, amongst other things, in the oblique truncation of the extremities, resulting in the forward position of the apices, of the organs of flight, and with the former, but not with the latter, in the radio-ulnar cell of its tegmina being wide and multicellular, and in the anal cerci being lanceolate and acutely bifid at the extremity; but it may be distinguished readily from both by the possession of a distinct though small frontal horn, foliaceously amplified fore coxæ, paucispinose fore tibiæ, with the spines of each side in a single short and decreasing series, 6-spined fore femora, a short first joint to its four posterior tarsi, a simple and unlobed abdomen, a straight pronotal long axis, and a venose anal gusset to its tegmina.

15. *TOXODEROPSIS SPINIGERA*, n. sp., Westw. & W.-M.

*Toxodera spinigera*, Westwood, MSS.

♀. Dark vandyke-brown the colour of a dead twig or of rotten leaves.

The frontal horn is a sharp spike-like projection.

Tegmina with the marginal field opaque dark vandyke-brown, an opaque whity-brown longitudinal streak extending from the base to beyond the middle of the wing immediately posterior to the anterior radial, diffusing itself along each side of the veins of the disk, and including the long polished stigma and the base of the anterior radial, the anal area smeared with dark vandyke-brown, and the longitudinal veins marked with somewhat blurred and smear-like spots and streaks of the same colour, especially at the apex, where every vein has a streak at its extremity. The posterior fork of the anterior radial is distinctly 4.

branched on one side, indistinctly so on the other. The divdens gives off an anterior branch which is connected both with its own main stem and with the posterior ulnar, thus furnishing the only instance known to me in which this vein is branched. The main stem of the plicata runs to the posterior margin direct.

Wings pellucid, increasingly from the base very pale smoky-quartz-colour, with the opaque anterior margin, the longitudinal veins, and the very fine, though very distinct, transverse veinlets, all increasingly from the base, and with streaks on the apical ends of the veins of the anterior area, vandyke-brown.

The fore femora, which have three pale rings especially well marked on the inner and under sides, are armed below on the outer edge with 6 spines and on the inner with 11; and the tibiae with 3 on the outer edge and 7 on the inner edge.

The dorsal crests of the four posterior femora are slightly produced triangularly opposite to the bend in the lateral ridges; and the upper or posterior ventral foliaceous lobe is divided by a narrow rounded emargination into two lobules, one much smaller and proximal, the other much larger and distal, which are again subdivided by angular notches into two obliquely pointed lobes.

The upper angle of the penultimate joint of the cerci though acute is not produced.

Total length 93 millims.; height of head 4, breadth between the points of the corneal spines 6·75, length of corneal spines 1·25; of pronotum 28·75, of which the anterior and posterior lobes are respectively 5·75 and 23, breadth at supracoxal dilatation 4, at hinder end 4·25; length of meso- and metanotum with seg. med. 16; length of abdomen without seg. med. 47, breadth at middle of 4th seg. 4, at apex of 6th seg. 6·25; length of tegmina 47·5, breadth at middle 8·25; length of wings 42·5, breadth 19; length of fore coxa 14·5, femora 19·5, breadth 2; length of tibia from base to insertion of tarsus 13; of intermediate femur 7·5, tibia 9·5, 1st tarsal joint 2; of posterior femur 8·25, tibia 11, 1st tarsal joint 2·25; of antennæ (absent); of cerci 8, breadth 2.

HAB.—Bombay.

#### 16. *TOXODEROPSIS TAURUS*, n. sp.

♂ ♀. Smaller. Colouring the same.

The frontal horn is truncate and in the female distinct bifid.

In the tegmina the main stem of the plicata runs to the margin after anastomosis with the divdens, which is simple and unbranched.

The fore femora are armed below with ♀ 5—5, ♂ 5—6 spines only on the outer edge and with ♀ 10—11, ♂ 11—11 on the inner; and the



tibiæ with ♂ ♀ 4—4 on the outer edge and ♀ 7—8, ♂ 6—7 on the inner.

In the posterior femora, the upper or posterior dorsal crest bears two or three saw-like teeth and the distal lobule of the ventral foliaceous lobe is divided right to its base and has a minute sharp spinule in front of it, of which but slight traces are to be seen in the other species.

The upper angle of the penultimate joint of the cerci is as much produced and as sharp as the tips of the terminal.

Total length ♂ 78, ♀ 88 millims.; length of pronotum, ♂ 21·5, ♀ 26·5, of which the anterior and posterior lobes are respectively ♂ 4·5, ♀ 5·75 and ♂ 17, ♀ 20·75, breadth at supra-coxal dilatation ♂ 3·5, ♀ 4, at hinder end ♂ 3·5, ♀ 4; length of meso- and metanotum with seg. med. ♂ 15·5, ♀ 16; length of abdomen without seg. med. ♂ 39, ♀ 42, breadth at middle of 4th seg. ♂ 2·75, ♀ 3·5, at apex of 6th ♂ 4·5, ♀ 6; length of tegmina ♂ 37, ♀ 44, breadth at middle ♂ —, ♀ 7·5; length of wings ♂ 36, ♀ 40, breadth ♂ — ♀ —; length of fore femur ♂ 15·5, ♀ 18, tibia, from base to insertion of tarsus, ♂ 10, ♀ 12; length of intermediate femur ♂ — ♀ 7·25, tibia ♂ — ♀ 10·25, 1st tarsal joint ♂ — ♀ 2; of posterior femur ♂ — ♀ 8·5 tibia ♂ — ♀ 11, 1st tarsal joint ♂ — ♀ 2·75; of cerci ♂ (broken off), ♀ 6·25, breadth ♀ 2.

HAB.—♂ Sind; ♀ Khurda, Orissa (*W. C. Taylor*).

The two succeeding genera differ from all the preceding in having the fore tibiæ multispinose on both edges, with the spines of both edges divided at irregular intervals into several irregular series by some of their number being longer and stouter than the others, and in having a long first joint to their four posterior tarsi, and from all except *Heterochata* and *Heterochatula* in not having the upper crest of the fore coxæ in the slightest degree foliaceously amplified at the apex.

#### Genus 9. TOXODERA, Serville.

*Toxodera*, Serville, Ann. Soc. Ent. Fr., 1837, t. vi, p. 27.—Hist. nat. d. Orthopt. 1839, p. 168, ♂.

♂ ♀. Sexes alike. Body greatly elongated, bacilliform.

Head broad, triangular; vertex between the eyes regularly arched, divided by two broad and shallow discal impressions into a median and two submedian lobes, which are separated from the unarmed stemmatal eminence by a transverse groove, and the two latter of which are limited off by fine grooves from the ample lateral lobes, which, with the eyes, are almost in the same plane with the rest of the vertex, being scarcely at all bent forwards; a strong ridge curves inwards and upwards on each side from a point at the ocular margin which is opposite to the

anterior margin of the antennal scrobe to the ends of the epicranial suture and is so directed at its upper end that it would if continued far enough pass into the groove which separates the lateral from the submedian lobes of the vertex; the facial shield has not shared in the widening of the head, a wide space intervening between it and the eyes; it may be described as a transversely elongated rectangular plate giving off a broad tongue-shaped process from its upper or basal margin, or as a broad isosceles triangle the two adjacent equal sides of which are deeply indented by the antennal scrobes. The eyes are compressed and somewhat drawn out superolaterally, where they bear a huge straight slender conical non-faceted spine. Stemmata large on a prominent cuboidal frontal eminence.

Prothorax very greatly elongated, as long as the abdomen to the middle of the sixth segment. Pronotum with its lateral margins granulose, becoming spinulose in front, deflexed in the posterior, nearly horizontal in the anterior lobe, which is bent up at an obtuse angle to the posterior lobe, is transversely convex, bears a few tubercles on each side of the middle line, and presents on its posterior enlarged end a broad and shallow longitudinal depression, which is continuous with a similar one on the enlarged anterior end of the posterior lobe, which is higher than broad, so strongly compressed as to be very steeply roof-shaped, and, with the sternal region, so strongly arched as to have the form of a bow, being concave ventrally and correspondingly convex dorsally, where it is surmounted by a blunt rather ill-defined raised line, on which, especially anteriorly, where some are collected into a small clump deforming the surface, are a few small mammilliform tubercles, and which at the ♀ broadly truncate-rotundate, ♂ triangularly produced (?), posterior end gives off a very narrow spirally coiled leathery process.

Mesonotum, metanotum, and seg. med. with a very strong raised dorsal line, which is continued decreasingly to the end of the 4th abdominal tergum, where it ends to begin again at the anterior end of the fifth tergum to be continued increasingly to the last.

The abdomen is of uniform width to the 6th segment, thence tapering in slightly arched outlines to its rounded extremity; all its terga bear in the middle line posteriorly a fringed cup-shaped foliaceous lobe the upper lip of which terminates in a delicate recurved filament, and which in the 5th and 6th is large, in the 5th very large, and conspicuous; ♀ sterna 2-6 with subequal foliaceous sub-quadrant-shaped duplicatures of the integument at middle of hinder margins; 10th tergum semioval, roof-shaped,  $1\frac{1}{2}$  times as broad as long. Cerci foliaceous, lanceolate, divided at the extremity by a deep notch into two sharp points, extending by more than two-thirds of their length beyond the abdomen.

Organs of flight equally well-developed in the two sexes, when closed, not quite reaching up to the foliaceous lobe of the 5th tergum, obliquely truncate at the extremity, so that the apex in both is subacute and falls just behind the anterior margin, and that there is no anal emargination in the hinder pair. All the longitudinal veins remarkably straight.

Tegmina with the marginal field tolerably expanded at base, irregularly reticulate, and semiopaque, the anterior radial forked at junction of outer and middle third and its upper prong running to the apex, the posterior radial simple, the stigma long and narrow placed as obliquely as possible across the radio-ulnar interspace and extended on to the two bounding veins, the anterior prong of the anterior ulnar forked, the cellules of the wide middle part of interspace between the anterior ulnar and the posterior radial in five transverse rows, the posterior prong of the anterior ulnar 2-branched, the dividens anastomosed with the posterior ulnar some distance short of the margin, the plicæ, which all but reaches the posterior margin, broken up into a reticulum contributed to by its three branches, none of which enters the anal gusset, which is hence reticulate. Wings with the anterior ulnar simple.

Legs tolerably long and slender. Fore coxæ strongly triquetrous, spinulose on the front crest, rough on the others, the front and outer ones produced at apex to sharp rough spines; femora strongly curved, obelavate, strongly sinuous and carinate above and angulate-rounded near the base below, at the apex trispinose, armed on the outer edge of the lower margin with 6 spines, on the inner edge with 14, on the disk with 3; femoral brushes thick, on distinct eminences; tibiæ multi-spinose, the spines divided into several irregular series by long spines, the 1st, 8th, 12th, 16th, 19th, and 22nd of the inner edge, and the 1st, 5th, 7th, 9th, 11th, and 13th of the outer edge, being subequal and longer than any of those between them. Four posterior femora shorter than the tibiæ, 4-crested, with a ridge on each side, both dorsal crests and the posterior ventral crest furnished with large lobulated foliaceous lobes, lateral genicular lobes long, but only half the length of the curved supra-genicular lobe, which is equal in length to the acicular genicular spines, tibiæ filiform, terete, without a trace of a crest either above or below, their calcaria acicular; 1st joint of tarsus long, longer than the three following taken together.

DISTRIBUTION.—Malayan subregion of the Oriental Region.

#### 17. TOXODERA DENTICULATA, Serville.

*Toxodera denticulata*, Serville, op. et loc. supra cit. pp. 25 et 169, pl. ii, et pl. v, f.

♀. Differs only in its larger size, and in having the tegmina a little more clouded with the brown blotches larger and deeper-coloured, and the posterior lobe of the pronotum more bowed.

The fore tibiae are armed on the inside, right with 23 spines, of which the 1st, 8th, 12th, 16th, 19th and 22nd, left with 22, of which 1st, 7th, 11th, 15th, and 18th, the 7th short one being absent, and on the outside, right (malformed) with 10, of which 1st, 4th, and 7th, left with 13, of which 1st, 5th, 7th, 9th, 11th, and 13th, from the apex are subequal and stouter and longer than any of the rest.

Total length 150 millims.; height of head 7, breadth between ips of corneal spines 13·5, length of corneal spines 2·5; length of pronotum in a straight line 57, of which the anterior and posterior lobes are respectively 11·25 and 46, breadth at supra-coxal dilatation 7·25, at hinder end 6, at middle of posterior lobe 3·9; height at middle of posterior lobe 5·9; length of meso- and metanotum with seg. med. 23; of abdomen without seg. med. to end of ovipositor, 70, to end of 10th tegmina 66, breadth at middle of 4th segment 6·5, height of foliaceous lobe of 5th tergum 10, of 6th tergum 8; length of tegmina 67·5, breadth at middle 14, of marginal field 3·25; length of wings 60, breadth 31; length of fore coxa 22, femur 30, breadth at angulation 3, length of tibia, from base to insertion of tarsus, 22·25, 1st tarsal joint 6; of intermediate femur without genicular lobes 22·5, tibia 27·5, 1st tarsal joint 7; of posterior femur without genicular lobes 22, tibia 32, 1st tarsal joint 10, lateral genicular lobes 3, supra-genicular lobe 5, genicular spines 5, of antennae 43; of cerci 14, breadth 3·5.

HAB.—Java.

#### Genus 10. PARATOXODERA, nov.

♀. Body greatly elongated, slender bacilliform.

Head much as in the preceding genus, but the lateral lobes of the vertex with the eyes distinctly bent forwards at an obtuse angle to the median and submedian lobes, and the facial shield broad triangular.

Prothorax also much as in the preceding, but the posterior lobe of its pronotum is straight; furnished in the mid dorsal line with three conspicuous equidistant thorn-like horns, the one basal thin and foliaceous springing entirely from the raised dorsal line, and the two others stout, rigid and hard, minutely bifid developed from the disk; and triangularly produced at its hinder end.

5th and 6th abdominal terga with large erect foliaceous lobes which do not end in a recurved filament; the preceding terga having only rudiments of lobes; sterna 3-4 with subequal quadrant-shaped foliaceous duplicatures of the integument at the hinder end. Cerci short, extending very little beyond the seventh sternum, broad pyriform in outline, their upper third bent outwards and downwards at an obtuse angle to the remainder.

The organs of flight do not reach beyond the end of the fourth abdominal tergum, but they are of much the same shape and structure, the chief differences being that in the tegmina the stigma is triangular and in the radio-ulnar interspace, extending on to the two bounding veins, the posterior prong of the anterior ulnar is 7-branched, the interspace between the anterior prong of this vein and the posterior radial is simple, not wide and multicellular, and the anal gusset is venose, being traversed by the posterior branch of the plicate; and that in the wings a slight anal emargination is present.

The crests of the fore coxæ are not produced at the apex; the femora and tibiæ are of similar shape and structure, but the former are 7-spined on the outside and 15-16-spined on the inside.

The four posterior legs are also similar, but the lateral genicular lobes are not acuminate produced, and the posterior calcaria of the tibiæ are foliaceous, lanceolate.

DISTRIBUTION.—The Malayan sub-region of the Oriental Region.

This genus is very closely allied to *Toxodera*, with which it agrees in the peculiar and remarkable character of the armature of the fore tibiæ, in the anterior lobe of the pronotum being tilted upwards at an obtuse angle to the posterior; and in having large erect and anteriorly buttressed foliaceous lobes at the hinder end of the 5th and 6th terga with rudiments of similar ones, which no doubt stood erect during the larval life of the animal, on all the preceding terga of the abdomen; but it differs therefrom, amongst other things, in having the fore femora 7-spined below on the outer edge, the posterior lobe of the pronotum quite straight and cornigerous, the radio-ulnar cell of the tegmina simple and similar to the other cells of the disk, the anal gusset of the tegmina venose, and the anal cerci very short and broad pyriform in outline, in characters, in fact, which, in my estimation, amply justify the foundation of a new genus.

18. *PARATOXODERA CORNICOLLIS*, n. sp.

♀. Body and legs brown the colour of a twig, with the hinder end, including the foliaceous appendage which arises therefrom, whitish-brown.

Foliaceous horn at base of pronotum very strongly hooked and produced forwards, the second horn erect, divided transversely into two sharp points, and the third, which is inclined forwards and rather larger than the second, divided longitudinally into two points.

Marginal field of tegmina to anterior radial, which is thrice annulated with whitish-brown, and a large irregular triangular mottling

extending therefrom in the transverse direction nearly halfway across the discoidal area and in the longitudinal direction for about two-thirds of the distance between the stigma and the apex, opaque rich vandyke-brown, the rest of the organ semitransparent whity-brown with a touch of grey.

Anterior margin of wings semitranslucent whity-brown marbled, with the veins at the apex streaked, with vandyke-brown, the rest hyaline with the veins whity-brown.

Fore tibiae armed on the inner edge with, right 32 spines, of which number the 1st, 8th, 14th, 19th, and 23rd, left 34, of which the 1st, 10th, 16th, 21st, 27th, and 29th, and on the outer edge with, right 18 spines, of which the 1st, 8th, 12th, and 16th, left 19, of which the 1st, 8th, 11th, and 15th, are much larger than the rest, the basal fourth and the basal third respectively being unarmed.

In the four posterior femora, the foliaceous lobe of the posterior or upper ventral crest is divided by a wide and deep rounded emargination into two bifid lobules, of which the distal is the larger; that of the upper dorsal crest, into three, of which the proximal is small and simple, the middle is rather larger and bifid, and the distal much larger and also bifid; and that of the lower or anterior dorsal crest, into two, of which the proximal is the larger and bilobed and the distal is the smaller and only obscurely sub-divided.

Male unknown.

Total length 112 millims.; height of head 5, breadth between tips of corneal spines 8·5, length of corneal spines 1·5; length of pronotum 4·4, of which the anterior and posterior lobes are respectively 5·6 and 3·8·4, breadth at supracoxal dilatation 4, near hinder end 4, at middle 2·5, height at middle 2·6; length of meso- and metanotum with seg. med. 16; of abdomen without seg. med., to end of 10th tergum 5·1, to end of cerci 5·4, breadth at middle of 4th segment 6, height of foliaceous lobe of 5th tergum 10·5, of 6th tergum 2·5; length of tegmina 4·3, breadth at middle 8·25, of marginal field 2·25; length of wings 4·1, breadth 2·1; length of fore coxa 15·5, femur 1·9, breadth at angulation 2·75, length of tibia from base to insertion of tarsus 15·25; of intermediate femur 13·5, tibia 1·4, 1st tarsal joint 4·5; of posterior femur 1·4, tibia 16·25, 1st tarsal joint 5·5; of antennae (wanting); of cerci 5, breadth 3·6.

HAB.—Java.

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